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ORIGINAL ARTICLES.

AMBLYOPIA FROM SUPPRESSION OF THE VISUAL IMAGE.[1]

BY WALTER B. JOHNSON, M.D., PATERSON, N. J.

At the last meeting of the American Ophthalmological Society, July, 1893, a case of "Suppression of the Visual Image" was reported in which the fixing eye which had normal vision was lost by accident. The squinting eye which was amblyopic with vision of fingers at 6″ gradually resumed its functions, and nineteen days after the accident regained the normal acuity of vision.

The conclusions were, that in the case reported the amblyopia was not due to structural changes either in the eyeball or nerve centers but to continued suppression of the visual image induced by convergence of the visual lines probably induced by an hypermetropia. The case here reported is another evidence of the existence of amblyopia exanopsia and clearly

[1]Read at the November meeting of the New York Academy of Medicine, Section on Ophthalmology and Otology.

indicates that the amblyopic eye does not enter into the visual act even though the eye may be successfully operated upon, and that although it does not resume its functions while the fellow eye is still selected for use, it has the ability to, and does return to its normal condition immediately after the loss or destruction of the fixing eye. The confusion of images, caused by the mental impression of sight in the formerly fixing but now cataractous eye in the case reported, indicates the persistence of mental impressions and explains why continued closure of a fixing eye in strabismus cases does not result in any material improvement in the vision of the amblyopic eye, the mental impression of the ability to see with the covered eye preventing the amblyopic eye from assuming the function of sight.

The fixing eye being almost invariably chosen to continue the visual act, the squinting eye not only has no stimulus to increase its power of vision but is deterred from resuming visual acuteness by the cerebral centers even if the visual lines have been paralleled by operation, because of the confusion of images accompanying any effort at vision.

The cerebral centers having lost the conscious activity of the visual functions from continued suppression, generally remain in that condition in preference to re-establishing binocular fixation with its attendant confusion and discomfort.

The persistence of the hypersensitiveness of the eccentric portion of the visual field in this case, even after the partial central scotoma had disappeared and central vision had practically returned, is indicated by the peculiar brightness and distinctness around the point of central fixation and by the decreasing mental confusion in locating objects and lack of confidence in walking until normal projection was finally established.

The difficulty of a return of normal vision in an amblyopic eye, which is apparent, and in the two cases reported, only occurred after loss of, or loss of sight in, the fixing eye and which in the case here presented was not influenced by a tenotomy, would seem to indicate that amblyopia is, in a large propor-

tion of squinting eyes, an acquired condition resulting from squint and but rarely a disease which is an etiological factor in the production of squint.

The etiology of acquired amblyopia can be logically demonstrated if it is admitted that hypermetropia produces a constant tension of accommodation necessitating an increased convergence of the visual lines, and that the deviation from the normal axis of vision thus produced causes confusion of images and subsequently diplopia.

The natural tendency of the visual centers is to relieve themselves of this diplopia which is an offending condition aud relief is attained by a gradual loss of physiological sensibility through psychical exclusion of the vision of one of the eyes. The selected eye may or may not have diminished visual acuteness due to a greater refractive error than the fellow eye, each eye, however, generally having an hypermetropia of a greater or lesser degree which is almost always present and is undoubtedly an important etiological factor in the production of convergent squint.

The importance of hypermetropia as a factor in prodncing squint is illustrated in the correction of refractive errors by properly adjusted glasses after operations for tenotomy; the relief of the tension of accommodation assisting in maintaining the parallelism of the eyes by removing the cause of the previous convergence, the eyes frequently appearing to be on a perfectly parallel plane with the glasses in position, and decidedly converged when the glasses are temporarily discarded.

The conscious activity of the visual functions of each eye is maintained and the condition of visual suppression does not generally occur as long as the eyes converge only periodically, or even when the convergence is of the alternating variety; but when constant convergence of one or the other eye is present the mental process of suppression may occur rapidly to an extent sufficient to prevent confusion of images and may subsequently become so excessive that the amblopia will render the eye practically blind in consequence of the continued condition which favors a desire to mentally abstract the

power of vision. The facts presented indicate the desirability not only of early operation in all cases of convergent squint before the amblyopic condition is fully established but also the adjustment of correcting lenses which relieve the tension of the accommodation and should be used in all cases of convergence whether an operation for tenotomy of the recti muscles is resorted to or not.

J. F., aged thirty, a strong, healthy man, applied for treatment at the Paterson Eye and Ear Infirmary. When a child he had a convergeuce of the right eye which persisted until he was about seventeen or eighteen years of age; at that time he was operated by Dr. Althoff at the New York Eye and Ear Infirmary; he was not fitted with glasses. He did not consider the operation perfectly successful, as his eye would turn in at times, especially when he became at all nervous or self-conscious.

He was not aware that there was any difference in the vision of his eyes until about one year ago when he called upon an optician for the purpose of selecting glasses for use in reading, in consequence of a scratching, burning and heaviness of the lids which troubled him at night.

He then discovered that he could not see to read as well with the right as he could with the left eye, and that a glass made no improvement in the vision of the right eye either for near or distance; his left eye he thinks was slightly improved both at distance and near by $+^{1}/_{32}$ which he bought at that time and has since used in reading at nights. August 28, 1893. While working at his trade as a machinist he was struck in the left eye by a flying piece of wrought iron chipping about one-half inch by three-fourths of an inch in size. He immediately applied for treatment. Examination disclosed a wound of the cornea about 3‴ in length in the infra-nasal quadrant with the iris prolapsed.

There was an appearance indicating the presence of some particles of iron adherent to the wound which was probably due to pigmentation from the iris as it could not be removed by the magnet and subsequently disappeared.

The cornea was stroked until the iris receded, although a portion midway between the pupilary margin and the limbus still remained in contact with the corneal wound, the anterior chamber being empty.

The vision of the right eye was then tested and found to be $^{20}/_{LXX}$, no improvement with glasses.

The patient was then sent to the hospital, cold applications were used continuously, and one drop of a solution of sulphate of eserine, one-half grain to the ounce, was dropped into the eye three times a day. September 1. The injured eye has made extremely satisfactory progress, the corneal wound having closed, the anterior chamber being re-established, a slight anterior synechia only being present, the patient has suffered but little pain, ophthalmoscopic examination, however, disclosed a traumatic opacity of the lens, the pupil is slightly irregular and there is some circumcorneal injection. Left eye, V.=fingers at 1′.

On this date, only four days after the injury, the right eye, on examination, shows R. E., V.=$^{20}/_{XX}$; $^{20}/_{XX}$ w. $+^{1}/_{24}$.

Ophthalmoscopic examination is negative, no lesion being discovered and the fundus appearing perfectly normal.

September 4, one week after the injury, the vision is still further improved.

R. E., V.=$^{20}/_{XX}$; $^{20}/_{XV}$— w. $+^{1}/_{24}$.

September 9. His vision is still improving, on this date, for for the first time he is able to read large print at the near point.

R. E., V.=$^{20}/_{XV}$; $^{20}/_{X}$ — w. $+ {}^{1}/_{24}$.

September 12, fifteen days after the injury, the eye used singly had normal vision, the patient was able to read.

Jæger No. 1 at ten inches.

R. E., V.=$^{20}/_{XV}$; $^{20}/_{X}$ — w. $+ {}^{1}/_{24}$.

L. E., V.=Fingers at 4′.

September 21. He has experienced great difficulty in accurately locating objects and has a constant lack of confidence in walking which is decidedly improved since the glass over the left eye was blackened three days previous to present visit.

Although he can only see to count fingers at four feet with the left eye, he complains that unless it is covered it interferes with his vision for near or distance, producing a blurring of objects, probably due to a cerebral impression that the left eye is about to engage in the visual act. He states that he feels now as he used to with the other eye before the injury, as though he could do better with one eye closed. When reading with both eyes open and without glasses he has great difficulty in separating and locating objects and a feeling of confusion and blurring rapidly supervenes. In distant vision he describes a peculiar brightness and distinctness around the line of letters on all sides.

October 4. R. E., V.=$^{20}/_{x}$ w. + $^{1}/_{24}$.
L. E., V.=fingers at 6′.

The vision in the left eye is improved in consequence of the absorption of some of the softened cortex of the lens, the patient finds that he is still unable to dispense with the black glass over the left eye without great confusion, especially when out of doors, although he frequently does not wear the glasses in the house.

November 18. The patient tested with both eyes open and without glasses. V.=$^{20}/_{xv}$ —.

With the left eye closed and without glasses there was but slight difference in the vision although the patient was much more comfortable. V.=$^{20}/_{xv}$.

With both eyes open and glasses + $^{1}/_{24}$ over each. V.=$^{20}/_{xv}$ —.

With the left eye closed and a glass + $^{1}/_{24}$ over the right eye. V.=$^{20}/_{x}$ w. + $^{1}/_{24}$.

The vision in the left eye was fingers at 6′, he still wears the glass over the eye blackened when reading and for distances, when walking or cycle-riding. In all the tests of vision the Snellen test type was used, the patient, however, being placed only fifteen feet from the card, although twenty has been used throughout as a numerator of the fraction.

CONCERNING EXOPHORIA.

BY JOHN DUNN, M.D., RICHMOND, VA.

PART I.

"Our patient, Miss X., has suffered since a number of years from spasmodic accommodation and also from various forms of reflex neurosis going out from the great sympathetic and *originating evidently in the lower spinal column and probably the plexus uterinus.* Among those symptoms were photophobia, hippus, *syncope of the retina*, sometimes hyperæmia of the retina and choroid with considerable ciliary neuralgia. No real pathological lesion could be revealed by the ophthalmoscope. Her manifest hypermetropia was $^{3}/_{4}$ D., her reading glasses $^{1}/_{2}$ D., when I saw her last year. The case is one of constant variation; sometimes *accommodative astigmatism is quite distinct*, but its correction has never given any satisfaction. Treatment consisted chiefly in tonics and nervines with eye rest."

Miss X., aged 47, remembers to have become conscious that she had eyes when she was 16, and at that early age they used to cause severe headaches which often lasted thirty-six hours continuously. Since that time her eyes have been the seat of more or less trouble. As time passed Miss X. became hysterical and was subject for years to attacks of hysteria of great severity. I shall mention only two of its manifestations: muscular spasms so intense that she would beg her physician to unbend the contracted parts no matter what force might be required; and, finally, hysterical coma. Her eye troubles have grown constantly worse, and, accompanying them, headaches of the severest forms. During these headaches the two spots of

greatest localized pain are the top of head, where the skull at times feels as if it would burst and where the pain is then so constant and severe that she has asked to have a gimlet hole bored through the skull to relieve the pressure, and it has even suggested to the patient that the wall of the skull was thickening at this point and compressing the brain; the second spot is the back of the neck where "a lump will form" and be the seat of intense aching.

When Miss X. was first seen, December 3, 1892, the condition of affairs was well described by her oculist, a part of whose letter begins this article. I have chosen this quotation as an introduction to these remarks, inasmuch as it serves to accentuate a point I wish to make in regard to the continuance of headaches in the presence of muscular anomalies. Reading had become impossible with or without glasses, for any attempt to read brought on "syncope of the retina," every thing would "become black as midnight before the eyes" and nothing of the surroundings was visible. These attacks lasted "a minute or two" and would then pass off; to be renewed whenever a fresh attempt was made to use the eyes. Blue glasses were worn to make the light endurable. So sensitive had the retina become to light that throwing a weak gas flame upon the fundus for the purposes of a brief ophthalmoscopic examination would cause a severe headache which would last for several hours.

During the next week the patient was seen several times; any examination of the eyes which lasted over a minute or two was impossible, owing to the severe pains it would cause in the head and eyes. I could find no pathological condition of the eyes to account for the series of nervous symptoms referable to the eyes. The fundus was normal; tension normal; media clear. No inflammatory symptoms of any kind, save, perhaps, an undue fullness and prominence of the subconjunctival veins. (Although, perhaps, a little out of place here, I may add that the cornea of each eye was undersize; vertical diameter being $9^1/_2$ mm., horizontal 10 mm.). No signs of glaucoma. In measuring the tendencies and strengths

of the various external ocular muscles, I found abduction 7, adduction 10, then 12. It required, however, an effort to overcome 12 and *following, immediately upon the effort, was extreme nausea, which lasted for some time.* With a Maddox cylinder no hyperphoria could be shown (and, *en passant*, I will add, that the Maddox prism is of no value, in determining, with any desirable accuracy, small degrees of hyperphoria). I found, however, that Miss X. had 3° exophoria.

At this time, owing to the great pain that followed any voluntary effort of their muscles, Miss X.'s eyes were so little well under control that accurate measurements of the strengths of the muscles were impossible. A minute a day for examination is a very little while. I, however, managed to find out that distinct exophoria existed. The eyes showed a slight amount of hyperopia, about $^1/_2$ D.

Now let us examine a moment the symptoms in this case and see the reasons for supposing the seat of the trouble to be the *"in the lower spinal column and, probably the plexus uterinus."* The symptoms are *spasmodic accommodation, photophobia, hippus, syncope of the retina, hyperæmia of the retina, and choroid* (?) *with considerable ciliary neuralgia, accommodative astigmatism, severe headaches.*

When I first saw Miss X., there was not a symptom mentioned above that did not result, *and almost immediately*, whenever she attempted to read, that is, to bring into play the muscles of accommodation for close vision, that is, further, to exercise the internal recti as opposed to the external recti and to make a call upon the ciliary muscle. Now, if the seat of the trouble were in the lower spinal column and uterine plexus, and these eye symptoms were the expression of discharges of nerve energy from *"the diseased areas,"* then these symptoms should appear of themselves and not await the use of the eyes to produce and continue them. Let Miss X. attempt to read (and with glasses correcting the refractive error), and, after a minute or two, syncope of the retina follows. It is a wide stretch of the imagination to attribute this syncope to disturbance of the uterine plexus due to reading, or to writing, or to

sewing. The attempt to overcome a 12° prism, base outwards, causes severe nausea, with such a fearful headache following it that the patient has to go to bed for hours. One feels at liberty to say that there is not a very close connection between a 12° prism and the uterine plexus. No. The trouble is an ocular one. Let me give an example from my note-book: Mr. G., aged 30, has ½° left hyperphoria; ½° esophoria for 20 feet; 4° exophoria for 12 inches. Continuous use of his eyes for reading or writing for several consecutive days and until late at night during this time will produce, and every time, migraine so severe that nothing but rest will relieve it; it is always preceded by hypersecretion of clear urine of very low specific gravity; during the time that the migraine lasts any attempt at close work, or any mental exertion, aggravates it; there is photophobia; and, further than this, the appearance of slight rings about a gas light, together with considerable ciliary irritation, as shown by the fact that the eyeballs are sensitive to the touch. Mr. G., after trying innumerable "remedies" has found nothing but sleep of any value. It is the use of the eyes that produces this unpleasant train of symptoms and, further than this, the symptoms extend into the regions the most varied claimed by Dr. Stevens for disturbances of the ocular muscular equilibrium.

There is another point of great interest in this connection, a point which, when more clearly understood, will serve to explain why in many cases rest of the eyes fails to relieve these muscular headaches; why headaches which originate from want of muscular equilibrium do not cease when the patient has desisted for a seemingly reasonable length of time from use of the eyes for close work. The argument would seem to be, if headaches result from the prolonged use for close work of eyes whose muscular balance is at fault, then abstaining from close work will cause the headaches to cease—but only within narrow limits is this the case. And yet the fact remains that headaches result from the use of such eyes, headaches which often persist for days and weeks and months, during which time *apparently* only the minimum amount of close work has

been done. Let us consider for a moment this question.

Miss X. had from time to time days of comparative comfort, but it was only at the expense of denying herself all social intercourse. For example, once, soon after she became a patient of mine, for three consecutive days she had comparatively little trouble with her eyes.

On the fourth day Miss X. dictated some letters, received friends, and was read to. In the evening her head began to ache. After retiring she was unable to sleep and being an excellent musician "she compared carefully in her mind several pages of one of Beethoven's sonatas with the notes of a late German composition which to her ear had a striking resemblance to Beethoven's work." She continued this comparison until she satisfied herself that the later composition had been plagiarized from the earlier. As a result of this mental music reading her headache increased until by the following morning its severity was fearful and continued for about thirty-six hours. And yet *apparently* Miss X. had not once during the day or night used her eyes for close work. What had she done? She had dictated words, to be written, we admit, by another person; she had listened to a person reading aloud, reading words, not a few of which represented ideas, rather than concrete objects, which ideas were stored away in the memory center as written or printed words; she had composed mentally two musical productions, which act involved the reproduction before the mind's eye of, to a greater or less degree, the musical forms as they appeared on the music sheet. What did these mental acts represent? In part, the exercise of the centers for memory of written or printed words and forms. How were these memories obtained? Primarily, through the use of the eyes and their musculature. And in obtaining them the greater part of the muscular work was done by the accommodative apparatus. As a necessary result of this the eye muscle centers in the brain become intimately connected with the centers for written words and forms and, in an educated person, the association tracts between these centers are necessarily well developed and important.

Injury to the supra-orbital nerve has been known to cause reflexly syncope of the retina, diminution of the field of vision, spasm of the accommodation, headache, etc., all of which reflex disturbances grew worse and worse so long as the injured nerve was left untreated and which, after treatment of the nerve, required several weeks to disappear. And, so far as I know, the best word explanation (and I use this expression inasmuch as we know neither the nature nor the limitations of nerve force) of these reflex disturbances is that they are the result of *nerve center exhaustion due to continuous excessive energy originating in a constant, abnormal focus of nerve disturbance.*

Exophoric eyes, save in certain cases of compensatory exophoria, are not formed by nature for close work and every attempt to use such eyes for accurate close vision requires an effort; unfortunately it is not a conscious effort and hence the person with exophoria is unable to limit the amount of the effort within confines beyond which eyeache results. Let me give an example: grasp the rubber bulb used to force air through a Paquelin's cautery reservoir and compress it several times in rapid succession; for the first few times we are conscious only of the effort of contraction of muscles of arm, hand and fingers; but soon the fingers tire, the wrist feels as though it were constricted, the arm and wrist pain, after a little we desist, being unable to continue the exertion, and our arm aches for a while after we cease. Thus does *excessive conscious exertion* produces pain. And there is no earthly reason why *unconscious excessive exertion* should not do the same.

The use of exophoric eyes for near work will produce in time nerve exhaustion of the centers for the eye muscles; the effort, if continued, will in time produce exhaustion in the centers allied by association tracts with the eye centers, among which some of the most important in educated persons are the centers for the memory of written words.

Continued still further this nerve disturbance will affect other areas and there is no reason, following this analogy, why reflexly there should not occur as the direct result of eye

trouble all the manifestations of nerve force of which the human brain is capable. Furthermore, I believe, that under certain circumstances, such is the case, and that when due consideration has been the subject that its importance will be given the recognition it deserves.

Thus, in Miss X.'s case, the severe headaches that occurred on the fourth day can be explained and most satisfactorily by remembering that the dictation of letters and the listening to the reading of a book require exertion of the centers for the memories for written words, which centers are intimately related to and in a measure owe their development to the existence of the centers for accommodation; and the exercise of the one necessarily causes exercise of the other; and lastly that the headaches were directly the result of exercise of the already exhausted centers of accommodation.

In this connection there is another point of some interest which may be brought out. Miss X. asked me, "why is it that as I grow older my headaches increase in severity, in number, and in duration, and why is it that my eyes become constantly of less use to me aud are the seat of so much trouble?" These questions are not easy to answer precisely. Miss X. is well educated and pushes her efforts to acquire knowledge to the limits of her physical ability, that is, until headache makes her desist; and when headache has caused her to "have all the blinds closed and everybody out of the room," her mind takes up the work her eyes refused to do and caries it on. Miss X. never leaves her room during the winter months, and takes during the warm weather the minimum amount of physical exercise. It has thus happened that for years, (and Miss X. has been or has considered herself to be an invalid for many years), the only muscles that have been exercised beyond a minimum have been the eye muscles, which muscles in turn have been all along so balanced that use of them for the very work they have been used for—*i. e.*, close work—was impossible save for a short time, because muscle strain quickly resulted. Consequently there has been overexertion of one set of muscles, there has been an undue

development (*i. e.*, compared with the other parts of the brain) of the connections between the eye muscle centers and the word memory centers. There has existed during these years in the centers for the eye muscles the condition of nerve exhaustion, which condition is kept up by the facts that any use of the eyes causes undue exertion, there being exophoria, and that even when the eyes are closed there results from exercise of the word memory centers additional strain upon the already exhausted motor eye centers owing to the extremely intimate connections between these two sets of centers. At first when Miss X. was young, over-use of the eyes produced eyeache, then headache, these being merely the signals of eye strain and then of nerve exhaustion in the eye centers, rest for a few days was sufficient to allow further use of the eyes. As years passed by, the calls made directly (by use of the eyes) and indirectly (from use of the associated centers) upon the eye muscle centers have increased in frequency until these latter centers never have time to recover from their condition of exhaustion—until, at last, any call upon the eye muscles for work results in the above-mentioned symptoms as shown in the eyes themselves, syncope of retina, etc., and the subsequent headaches. While it goes without saying that in the case of Miss X. there are many conditions that demand attention, no hope of a permanent cure can be reasonably entertained, until the eye muscles have, as the prime cause, been put into a state of equilibrium.

While the above remarks have suggested themselves as an index to an explanation of the cause and continuance of the headaches in the case of Miss X., the idea is not intended to be conveyed that a good education is a *sine qua non* for headaches resulting from exophoria, for this condition may produce almost continuous headaches in people whose book education is deficient, and also in those whose mode of living requires constant contact with the outer world and who live active lives. One of the worst cases I ever met with was that of Mrs. H., the wife of a farmer. Health bad. Her education was limited and her life active from necessity, and yet for years

headaches had made her life well-nigh unendurable. Nor are headaches from exophoria confined to women. This condition is sometimes the cause of severe periodic headaches in men, who enjoy, apparently, the best of physical health. Many of the cases of exophoria that have come under my observation have very small refractive errors; some showing a refractive error of $^1/_2$ to $1^1/_2$ D. cyl. ax. 90°, and in these cases correction of the muscular error often renders the use of a glass unnecessary. In looking over the docket one is struck with the fact that the charges against exophoria vary much in the different cases; nor is it always easy to see why.

In the case which suggested this article we touch upon the boundaries of that unknown region, hysteria; we have a patient whose bodily powers are impaired seriously, whose "general health is bad," but we have severe headaches which result whenever the eyes are used, and exophoria exists. As far as my experience goes, in the majority of cases of headaches, which resulted, so far as any assignable cause could be discovered, from exophoria, the possessors of this trouble have been well nourished and, most people, judging from appearances, would envy them their health. Not only does their general health appear to be excellent, but it is excellent, and they pay the penalty, headache, only when they have forced conclusions with their eye muscles. Unquestionably the general health has not a little to do with the freedom from or absence of headaches in the presence of heterophoria, but, at the same time, it is the heterophoria that is the starting point of the headache and not the condition of the health.

It may not be out of place here to say a word or two in regard to headache accompanied by eyeache as "a reflex neurosis originating in the plexus uterinus." To my mind, observation but strengthens the reasons for believing that for uterine trouble to be accompanied by headaches with eyeache, there must exist some refractive error, or some imperfection in the ocular muscular equilibrium, or a combination of both.

I have in mind the cases of two young, unmarried women, both of whom have suffered for years from derangement of the

menstrual function. One of them suffers constantly from headache and eyeache, the other does not know what this combination of miseries means. The former's eyes have both refractive and muscular errors; the latter's eyes are practically normal. Headache with eyeache has in my practice, so far as I know, found its expression only in those persons where there existed ocular irregularities.

Naturally, any trouble, whether confined to one region, as the uterine, or whether general in character, tends to weaken the whole constitution, and will find expression, reflexly if you will, in those regions already abnormal or irregular in their functions; but the point I wish to make is, that when we find headache with eyeache, (apart from those rare cases where this is a symptom of tumor, etc.), no matter where be the leading cause, the uterus, the ovaries, the liver, the general system, there exist also ocular irregularities, and that just in proportion as we shall be able to correct these irregularities in the same proportion will the headache with eyeache cease to be "the chief symptom" of the trouble. The treatment of exophoria in its various combinations will be considered in the conclusion of this article.

SOCIETY PROCEEDINGS.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

HENRY POWER, M.B., F.R.C.S., VICE-PRESIDENT, IN THE CHAIR.

THURSDAY, NOVEEBER 9, 1893.

NEOPLASM OF THE IRIS.

Mr. Lawford read the report of the Committee on Mr. Beaumont's case of Neoplasm of the Iris.

BENZOYL-PSEUDO-TROPEINE AS A LOCAL ANÆSTHETIC IN OPHTHALMIC SURGERY.

This paper was read by Mr. T. J. Bokenham. He said benzoyl-pseudo-tropeine, or tropa-cocaine, was a new coca-base extracted from the small-leaved coca plant of Java, and was identical with the pseudo-tropeine obtained from hyoscyamus. The alkaloid as obtained from the plant had considerable irritating properties when introduced into the eye, but this was not the case when it was obtained by synthesis. The specimen of the synthetically prepared alkaloid, in the form of hydrochlorate, was made into a three per cent. solution, and tested by the author. It was found most efficient for inducing anæsthesia of the cornea, and had the advantage of causing no dilatation of the pupil, and none of the ischæmia characteristic of the action of cocaine. There was no disturbance of

accommodation following its use. As an anæsthetic to the lid before applying mitigated stick or lapis divinus, a ten per cent. solution had been found as successful as a corresponding strength of cocaine. This had been found sufficient in such operations as strabismus, division of stricture of lachrymal duct, and opening of Meibomian cysts. Tropa-cocaine had the following advantages as compared with cocaine: It caused no dilatation of the pupil, and no disturbance of accommodation; it was much less poisonous than cocaine, and it did not, if swallowed, produce delirium. The vascular condition of the eye was not affected by it, and in the form of a solution it kept better than cocaine.

SPONTANEOUS RUPTURE OF CAPSULE AFTER IRIDECTOMY PRELIMINARY TO CATARACT EXTRACTION.

This paper was read by the Secretary for Mr. J. T. Rudall (Melbourne). Five months after an uncomplicated preliminary iridectomy it was found that the cortex of the lens had undergone partial absorption, allowing a clear space between the nucleus, which appeared to be somewhat tilted backwards, and the upper edge of the cornea. It was probable that a limited spontaneous rupture of the capsule had taken place. Fearing that the nucleus of the lens might fall back into the vitreous, the author removed it. No vitreous was lost, and the recovery was uncomplicated.

EXTREME HYPHÆMA OF BOTH EYES WITH CORNEAL ABSCESS OF RIGHT EYE OCCURRING AS A SEQUELA OF SMALL-POX.

This paper was read by the Secretary for Dr. Kenneth Scott (Cairo). Ten months before admission into the Kasrel-Aïni Hospital the patient, a boy, aged nine, had been attacked by small-pox, which was immediately followed by loss of vision in both eyes. At the time of admission there was a circumscribed abscess of the center of the right cornea, the anterior epithelium being intact. There was no pain nor lachrymation,

and only moderate injection. The anterior chambers of both eyes were filled with a dark red brown mass, completely concealing the iris. There was no trace of irritation of the left eye. The tension of both eyes was normal. Vision equalled perception of light. After seven weeks' treatment the corneal abscess disappeared, and the upper third of the red brown mass in both anterior chambers had become of a light buff color, and quite transparent. The patient was kept under observation three months longer, but the eyes remained in exactly the same condition.

LIVING AND CARD SPECIMENS.

Messrs. Critchett and Juler—Case of Pemphigus of the Conjunctiva.

Mr. G. Anderson-Critchett—Case of Conical Cornea Treated by the Galvano-Cautery Without Perforation.

Mr. Juler—Case of Central Colloid Changes in the Retina.

Mr. Frederick Bass—A Pocket Refraction Case.

Dr. Rayner Batten—Persistent Hyaloid Artery Branching in Vitreous.

Mr. Donald Gunn—Case of Syphilitic Conjunctivitis.

SELECTIONS.

LEGISLATION IN THE UNITED STATES FOR THE PREVENTION OF BLINDNESS.[1]

BY LUCIEN HOWE, M.D., BUFFALO, N. Y.

At the meeting of the American Ophthalmological Society in 1887, I presented a short article in regard to the increase of blindness in the United States, calling attention to the fact that according to the census reports, the number of blind in this country was increasing much more rapidly than the population. The Society was kind enough to appoint a committee to examine into the subject, as did also the Medical Society of the State of New York, after the same figures had been presented there for consideration. The committees in both of these Societies reported the advisability of some legislation to limit the further increase of what may be considered one of the principal causes of blindness, namely, ophthalmia neonatorum. Since that time, the States of New York, Maine and Rhode Island have all passed laws which have for their object the preventative treatment of this disease, and I wish here to show the desirability of similar laws in other States.

The facts in regard to the subject were published in the Transactions of the New York State Medical Society and of the American Ophthalmological Society so completely that there seemed but little to add to the subject. Since then, however, the statistics gathered by the census of 1890 have

[1]Read in the Section on Ophthalmology, at the forty-fourth annual meeting of the American Medical Association.

been obtained, and these furnish sufficient additional data to warrant my calling attention to the subject again, and recapitulating briefly the reasons why legislation in various States should be enacted for the prevention of blindness.

In 1880, for the first time, a systematic attempt was made to ascertain the entire number of the defective classes—these among the rest—and when the statistics for that year were compared with previous years the apparent increase was astonishing.

When, however, the number of blind in 1890 is compared with the number in 1880, we find that there is an increase of only 3.20 per cent., there having been in 1880, 48,929 blind, and in 1890, 50,411. There are good reasons, however, for considering that this last census gave a much less complete record of such persons than did the census of 1880. I am indebted to Hon. Robert D. Porter for a type-written copy of the returns concerning the blind taken June 1, 1890. The summary shows that there is a total of 50,411. Male, 27,983; female, 22,458; white, 43,351; colored, 7,090; natives, 41,265; foreign, 9,146.

In some States this increase has been very slight; in others quite marked. But whether the number it large or small, the important fact remains that a really large percentage of the blindness is caused simply by neglect in early childhood. I mean, as a result of ophthalmia neonatorum. It is difficult to estimate exactly what percentage these cases bear to the total number of the blind, but various authorities estimate this from nine and one-half to ten per cent. or even more. In other words, on examining the figures carefully, we can say that without fear of exaggeration there are wellnigh five thousand blind in the United States, who are in that condition merely because of neglect on the part of those who had charge of them in early infancy. If the estimates were based upon the number of blind in asylums the percentage would be almost twice as large, as has been proved by an examination of a large number of inmates of the blind asylums not only in this country but also in Europe. The details of this are re-

ferred to in the papers already mentioned, and the facts can be easily substantiated by reference to the works of Fuchs, Magnus and others. On an average it may be stated, with a considerable degree of accuracy, that at least eighteen and one-half or nineteen per cent. of all the blind in early life are in this condition from ophthalmia neonatorum.

This fact would bear statement in detail were it necessary, or were it in accordance with the limit proposed for this short communication. Another fact which I would mention is one which also can be briefly stated before a society of those accustomed to treat ophthalmia neonatorum. This is, that ophthalmia neonatorum can now be considered a preventable disease. I need not elaborate this by calling your attention to the figures presented by Credé and others, or by referring to my own experience, or that which occurs in the practice of every one who has to deal with this disease. We all know how favorable a prognosis can be given in the early stage, and on the other hand we know how extensive are the ravages which may follow after ulceration of the cornea has once begun. All agree, I think, that when these cases are seen within the first week after birth a generally favorable prognosis may be given.

This brings me to the next point which I wish to make: that is, the desirability of legislation which should force nurses and attendants to bring these children to the notice of practitioners while the disease is still in the very earliest stage. The story is a familiar one of the infant being brought to the office of the oculist, with the cornea ulcerating or perhaps perforated, and the mother and sometimes the attending physician thinking that the child has "taken cold" and requires perhaps no further treatment than the hot water or milk which has been applied to the eyes. And the scene, also, is unfortunately familiar, of the mother weeping over a hopelessly blind child, all simply because the nurse has supposed that the infant has merely taken cold and had been relying upon some of the numerous household remedies just a little too long. The question before us, therefore, is what means can be adopted to

bring these children as soon as possible to the notice of a competent physician. Education of the laity is useless. Urging the nurses, professional or others, is equally insufficient. It remains only to place the responsibility at once where it belongs, by imposing upon such persons a severe penalty. The surest and best means of accomplishing this is undoubtedly by legislation.

This was the view taken of the subject by those who have considered it most carefully; and following the plan which had been partially adopted before in Switzerland, and elaborating it, a concise but explicit bill for the proper protection of these infants was passed by both houses of the New York Legislature, 1890, without a dissenting vote, and became a law. The law was known as Chapter 41 of the laws of 1890, and was as follows:

AN ACT FOR THE PREVENTION OF BLINDNESS.

SECTION 1.—Should any midwife or nurse having charge of an infant in this State, notice that one or both eyes of such infant are inflamed or reddened at any time within two weeks after its birth, it shall be the duty of such midwife or nurse so having charge of such infant, to report the fact in writing, within six hours, to the health officer or some legally qualified practitioner of medicine, of the city, town or district, in which the parents of the infant reside.

SECTION 2.—Any failure to comply with the provisions of this Act, shall be punishable by a fine not to exceed one hundred dollars or imprisonment not to exceed six months, or both.

SECTION 3.—This Act shall take effect on the first of September, eighteen hundred and ninety.

My own impression is that this law was sufficient to cover all cases, and a sufficient number of convictions could have been obtained under it, not only to call public attention to the existence of the law, but also to prove a wise and very excel-

lent lesson to the class whom it was practically to affect. A few convictions would have more effect in educating the laity and those who pretend to be nurses than would any number of lectures, leaflets or appeals of any kind. One or two partial attempts were made under that law to bring nurses to trial in New York City, especially by Dr. Derby, of the New York Eye and Ear Infirmary. He thought, however, that a loop-hole was left by the word, "notice," because nurses would be apt to say when placed on the stand that they had not noticed any such redness of the eyes or discharge from them. This is such a small excuse that it ought not to prevent the working of the law as there presented. Another objection to this was that it was not quite strong enough, and not being a felony, it might be difficult to place the responsibility on the proper person for beginning a suit.

The matter therefore, was taken in hand by Hon. Elbridge Gerry, who for many years has identified himself with legislation for children. The substance of this law has been incorporated in another. known as Chapter 325 of the laws of New York for 1892. The clause in regard to this reads as follows:

* * * Being a midwife, nurse or other person having the care of an infant within the age of two weeks who neglects or omits to report immediately to the health officer or to a legally qualified practitioner of medicine of the city, town or place where such child is being cared for, the fact that one or both eyes of such infant are inflamed or reddened, whenever such shall be the case, or who applies any remedy therefor without the advice, or except by the direction of such officer or physician, etc.

It is further provided that this is to be punishable as a felony.

We can, therefore, consider that in New York we have a law sufficiently stringent to teach nurses and midwives what their duties are, and parents what risks their children run when there exists what is ordinarily called a simple "cold in the

eyes." It is important that the first cases should be so clear as to make conviction a practical certainty and in my own vicinity, at least, some cases of probable guilt have been allowed to pass unpunished. But it can only be a question of a short time before a good typical violation of this statute comes under some one's notice, and after having been once tested subsequent convictions will be easy.

The State of Maine was the second to pass such a law. There the matter was taken in hand by Dr. Holt, of Portland, with his associates. The bill was known as number 97 of the Senate, and has become part of the laws of 1891. The text is as follows:

SECTION 1.—Should one or both eyes of an infant become reddened or inflamed at any time after birth, it shall be the duty of the midwife, nurse, or person having charge of said infant, to report the condition of the eyes at once to some legally qualified practitioner of medicine of the city, town or district in which the parents of the infant reside.

SECTION 2.—Any failure to comply with the provisions of this act shall be punishable by a fine not to exceed one hundred dollars, or imprisonment not to exceeed six months, or both.

SECTION 3.—This Act shall take effect on the first day of June, eighteen hundred and ninety-one.

The third State to have such a law was Rhode Island. In that State the subject was brought to the attention of the Legislature, principally through the exertions of Dr. F. T. Rogers. That was passed at the January session of 1893, and the text is as follows:

SECTION 1.—Should any midwife, or nurse, or person acting as nurse, having charge of an infant in this State, notice that one or both eyes of such infant are inflamed or reddened, at any time within two weeks after its birth, it shall be the duty of such midwife or nurse, or person acting as nurse, so having

charge of such infant, to report the fact in writing, within six hours, to the health officer or some legally qualified practitioner of medicine of the city or town in which the parents of the infant reside.

SECTION 2.—Every health officer shall furnish a copy of tbis Act to such person who is known to him to act as midwife or nurse in the city or town for which such health officer is appointed, and the Secretary of State shall cause a sufficient number of copies of this Act to be printed, and supply the same to such health officers on application.

SECTION 3.—Every person who shall fail to comply with the provisions of this act shall be fined not exceeding one hundred dollars, or imprisonment not exceeding six months, or both.

SECTION 4.—This Act shall take effect July 1, 1893.

It will be observed that the three laws now in existence are very similar, and as that of the State of Maine omits the word "notice," and is still complete in itself, it is perhaps the best thus far enacted, except that the penalty is too light.

A question might arise as to what advantage it is to oblige nurses and midwives to report to physicians a disease of which a certain class of so-called doctors are almost as ignorant as the nurses themselves. The answer to this is three-fold:

1. The nurse is made to apprectate her responsibility, not only in that case but in others, and to know that the condition indicated by the redness and discharge is not anything to be trifled with.

2. The parents also become alarmed when they know that the disease is sufficiently serious to be the subject of special legislation, so that in choosing a practitioner they select with rafher more than ordinary care.

Finally, as far as the physician himself. If he accepts the case he feels that he must understand it thoroughly and he will be apt to look it up with considerable care in his text-books and treat it intelligently. Above all, if he fails to do

that, the parents have a responsible individual against whom they can with perfect justice enter a suit for malpractice, and if he has proved himself incompetent he not only suffers the penalty which a law has provided for him, but one such case would be an example to him and to other practitioners in the community in which it occurred.

It seems needless to urge further the advisability of similar laws in other States, especially in those where there is a large proportion of foreign emigrants in the population. We know that their children are not only often cared for by midwives, but also often given over to them entirely at an early age, and women when accustomed to assume any such responsibility must be taught this part of their duties. If they will not learn in any other way, a heavy fine or imprisonment is but a small penalty for the crime of having blotted out the sight of a human being. Where the German population is large the children are often cared for entirely by midwives and these, though usually qualified by instructions obtained in their native countries, are also not frequently ignorant and careless in the extreme, and need to be taught that the hand of the law may interfere for the protection of the children given into their charge.

Having shown that such legislation should be enacted, and that it is our duty to lend our efforts and personal influence to obtain it, I wish to say, finally, that it can be done usually with little effort. Of course in any such undertaking it is necessary to enlist the sympathy and co-operation of a few leading men in each branch of the Legislature—those whose standing and character is such as to command respect for any measure which they advocate. The personal co-operation of the Governor is also a warrant of success from the first. But the average legislator is ready to listen patiently to any such claims of an unfortunate class, and his assistance for the bill is not difficult to obtain, being certain, as he is, that the originators of it have only the best motives. If the politician hesitate or are inclined to smile at measures for the relief of sore-eyed babies they are quickly brought to their senses, if con-

fronted by such evidence as is unfortunately always at hand in every large city, or can be easily obtained among the inmates of every asylum for the blind. Such men realize that they have with them the hearty approval of their constituents, of the press, and of the people, and that they are saving from a life of misery, to which death is often preferable, a large class of those who would otherwise be hopelessly blind.—*Journal of the American Medical Association.*

CONCERNING MILD CONJUNCTIVAL INFLAMMATIONS AND THEIR LOCAL TREATMENT.

BY G. E. DE SCHWEINITZ, PHILADELPHIA.

It has been estimated that about sixty-three per cent of patients applying for treatment of their eyes in hospital service, and probably half that number in private practice, suffer from one or more of the diverse types of conjunctival disease. Not the least important, so far as the comfort of the patient is concerned, are the minor inflammations,—irritations, hyperæmias, and mild conjunctivitis. Often rapidly dissipated by means of simple soothing lotions, they occasionally cling with aggravating persistency to their area of occupancy. Even when the cause is removed—local irritants, lachrymal obstructions, diseases of the nasopharynx, various states of depraved health, vaso-motor disturbance, and eye-strain, either from defective muscular balance or from uncorrected ametropia—the conjunctiva may be long in assuming a normal aspect.

For more than a dozen years solutions of boric acid have been much employed by ophthalmic surgeons under these circumstances, as well as for inflammations of a higher grade which affect this membrane. A saturated solution (about four per cent) would be a suitable strength were it not that there is a tendency, with the changes of temperature, for the drug to be deposited at the bottom of the vessel which contains the lotion; hence it is ordinarily employed in three-per-cent solution, in which strength it is detergent, slightly astringent, and moderately antiphlogistic, at least these are the virtues to which its favorable action is usually ascribed. True, feeble antiseptic properties are also attributed to it, but if at all efficient in this respect, the concentration should be about 1 to 13,

and not 1 to 33, as it is generally used; and as this concentration is not possible except under special conditions, it does not avail in practical therapeutics.

The detergent properties are probably the most important. Alkalinity of the lotion and corresponding improved cleansing power may be effected, as suggested by Jackson (Philadelphia *Polyclinic*, August, 1893), by the addition of sodium biborate in the proportion of four grains to the ounce, although his statement that a solution of boric acid itself is faintly alkaline is not in accord with generally accepted ideas, nor with tests which have been made to ascertain the accuracy of this assertion. Probably owing to the slight astringency of boric acid, many patients complain of an unpleasant dry sensation after its solution has been applied to the conjunctiva. It may be almost wholly avoided without destroying this or any other qualities of the drug, by adding two or four grains of sodium chloride to the mixture. Indeed, the addition of the salt enhances the therapeutic value of the lotion.

The usual method of applying these solutions is with a pipette or by means of an "eye cup," but distinct advantage is gained by atomizing the fluid with an ordinary hand instrument or, still better, with the aid of an air-compressor, the pressure being just sufficient to create a uniform gentle spray, which is allowed to play upon the inflamed or irritated surfaces. The liquid thus applied readily cleanses the affected areas, and probably medicates not merely their surface, but slightly penetrates the tissues and correspondingly increases the extent of the contact and prolongs the action of the drug. It is not improbable that equally good effects may be secured with a physiological salt solution, or even with boiled distilled water; but the distinct value of the drugs just described is so universally conceded, and, indeed, demonstrated, that no good reason can be assigned for dismissing them from practice.

When the conjunctival affection assumes a hyperæmic type, abnormal secretion being practically absent and the congestion largely confined to the bulbar conjunctiva, excellent results are obtained by using a method advocated by Königstein ("Die

Behandlung der häufigsten und wichtigsten Augenkrankheiten," Wien, 1889) in the treatment of vaso-motor blepharitis,—namely, douching the closed lids with water at a temperature of 60° F. from a vessel raised a short distance above the head of the patient, the fluid being conducted through a small apparatus in the form of the rose ordinarily seen upon watering-cans, and thus distributed in fine shower-like jets. The temperature of the water may be varied according as a hot or cold lotion is indicated, and the application is more agreeable, if not more efficient, by the addition of a little eau de Cologne.

Washing of the eyes with tepid water and Castile soap is productive of good results,—a method likewise suited to forms of moderate conjunctivitis characterized by a secretion just sufficient to glue the lids in the morning. It is astonishing how this simple procedure, much employed by Knapp in preparing eyes on which the operation for extraction of cataract is to be performed, will subdue redness and irritability of the conjunctiva and margins of the lids. The stronger astringents and antiseptics,—alum, sulphate of zinc, bichloride of mercury, and particularly nitrate of silver,—while fulfilling evident indications in more aggravated lesions of the conjunctiva, are not applicable to these moderate affections, which yield more readily to the mild measures which have been described.—*Therap. Gaz.*

NEWS.

THE INTERNATIONAL MEDICAL CONGRESS.

Dr. A. Jacobi, Chairman of the American National Committee of the Eleventh International Medical Congress, has received the following communications from the Secretary General:

1. Papers to be read in any of the Sections of the Congress should be announced on or before January 31, 1894, to the Secretary General, Professor E. Maragliano, Ospedale Pammatone, Genoa, Italy.

2. The title of the paper ought to be accompanied with a brief abstract of its contents and conclusions.

3. The programme to be distributed will contain the titles of all the papers announced before August 31, 1893, and since.

4. The reductions granted by the railway companies months ago will be available from March 1 to April 30, 1894.

In the intesest of such medical men as sail for Europe before official cards have been received from the general committee, Dr. Jacobi proposes to supply, in as official a form as he thinks he is justified in doing, credentials which are expected to be of some practical value. It is suggested, besides, that a passport may increase the traveler's facilities.

A letter of the Secretary General's, dated November 29, informs Dr. Jacobi that "traveling documents" will be sent to the address of every subscriber on or before February 15, 1894, and after that date "congressists" will have to apply to Dr. Jacobi.

It also contains the following regulations of former circulars: Members' dues are five dollars (money order to Prof. L. Pagliani, Rome); guests' (wives and adult relations'), two dollars; medical students,' no fees. All are entitled to traveling documents. Reductions on the Italian railways are available from March 1 until April 30.